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place. Such megaspores form prothallia whose nuclei have $2x$ chromosomes, and finally an egg is formed with $2x$ chromosomes, and this egg develops an embryo with $2x$ chromosomes; so that the sporophyte number of chromosomes is maintained throughout the life-history. But in the same species there are instances of reduction of chromosomes, so that prothallia and egg have the x or gametophyte number.

In forms which produce apogamous embryos, microsporogenesis is likely to be abnormal, the development often stopping before the nucleus of the microspore mother cell divides; but here again normal microspores with the reduced number of chromosomes are sometimes formed. The nuclei of the x and $2x$ prothallia can be distinguished in a general way by their size, the diameter of the nuclei in $2x$ prothallia being about one-third greater than those in x prothallia; also the diameter of the eggs with $2x$ chromosomes is about one-fourth greater than that of eggs with the reduced number.

STRASBURGER uses the term apogamy rather than parthenogenesis because he regards an egg with $2x$ chromosomes as a purely vegetative cell. He would use the term parthenogenesis only in case an egg with x chromosomes should develop an embryo without fertilization. Even if $2x$ chromosomes should appear at the first mitosis in such an egg, he would still regard it as a genuine case of parthenogenesis.

The preparations naturally showed many stages in the development of spore membranes. Shortly before the spore reaches the periphery of the vesicle containing it, the perinium appears. This is a delicate, fine-pored membrane (*Häutchen*) laid down upon the surface of the vesicle by the surrounding tapetal plasmodium. The prismatic layer is then laid down upon the delicate membrane. The exine, mesopore, and endospore are then developed in succession upon the protoplast of the spore. This study supports the view that cell membranes arise only in direct relation with protoplasm.—CHARLES J. CHAMBERLAIN.

Items of taxonomic interest.—S. M. BAIN and S. H. ESSARY (Jour. Mycol. **12**:192, 193. 1906) have described a new anthracnose of alfalfa and red clover (*Colletotrichum trifolii*), which is said to be the most serious plant disease occurring in Tennessee.—J. M. GREENMAN (Field Columbian Mus. Publ. Bot. Ser. **2**:185–190. 1907) has published 10 new species of Citharexylum as preliminary to a synoptical revision of the genus.—E. HASSLER (Bull. Herb. Boiss. II. **7**:161–164. *figs.* 5. 1907) has described a new genus (*Dolichopsis*) of Leguminosae from Paraguay.—L. A. DODE (*idem* 247, 248. *figs.* 3) has described a new species of Juglans (*J. elaeopyren*) from the Santa Catalina Mountains of Arizona; it is distributed in Pringle of 1881 as *J. rupestris* Engelm., and the type is in Herb. Barbey-Boissier.—A. H. MOORE (Proc. Amer. Acad. **42**:521–569. 1907), in a revision of the confused genus Spilanthes, recognizes 63 species; describes as new 2 subsections, 8 species, 4 varieties, and 7 forms; and makes 14 new combinations.—W. H. BLANCHARD (Torreya **7**:55–57. 1907) has described a new Rubus (blackberry) from the vicinity of Philadelphia and Washington.—J. R.

DRUMMOND (Kew Bull. **1907**:90–92) has described a new genus (*Chlamydites*) of Compositae from Tibet.—H. D. HOUSE (Muhlenbergia **3**:37–46. 1907) has described 15 new species of Ipomoea from Mexico and Central America.—REHDER (Rhodora **9**:60–62. 1907) has published a new variety of *Quercus prinoides* from Mass. and N. J.—FINET and GAGNEPAIN (Bull. Soc. Bot. France IV. **6**:55–170. *pls. 9–20.* 1906), in continuation of their *Flore de l'Asie orientale*, have presented the Anonaceae, including 25 genera represented by 249 species, 28 of which are new.—O. E. JENNINGS (Ann. Carnegie Mus. **4**:73–77. *pl. 20.* 1906) has described a new species of Lonicera (*L. altissima*) from Penn.—H. D. HOUSE (Bull. Torr. Bot. Club **34**:143–155. 1907), in his third paper on N. Am. Convolvulaceae, has described a new species of Calycobolus.—K. K. MACKENZIE (*idem* 151–155) has described 4 new western species of Carex.—W. W. ROWLEE (*idem* 157–159) has described 2 new species of Salix from the Canadian Rocky Mountains.—J. M. C.

Riella and Sphaerocarpus.—In the eleventh of his *Archegoniatenstudien* GOEBEL discusses germination and regeneration in these aberrant liverworts,[12] in extension of the investigations recorded in no. IV. Having an abundance of living material, Riella being easily cultivated, he is able to show that the peculiar "wing" of Riella is not an "outgrowth" from an earlier-formed midrib, but that the germ-disk lies in the same plane as the wing and expands directly into the plant (homoblastic development), as soon as the intercalary growing point is organized and becomes active.

Herein he controverts SOLMS-LAUBACH and PORSILD, who seem to consider the development as heteroblastic, holding that the thallus arises, as a different structure, so to speak, from the germ-disk (which SOLMS called protonema and PORSILD the primordial lobe), much as a sphagnum stem arises from its prothallus. GOEBEL (who, however, denies any special interest in such a question), in agreement with PORSILD but contrary to SOLMS, finds no wedge-shaped apical cell in the growing point until a late stage of development. When after injury or under bad conditions adventive shoots are formed, whether on the thallus or germ-disk, there is first the production of simple one-layered regions like the germ-disks, i.e., secondary disks, and from these the new thalli arise directly, as in sporelings.

In Sphaerocarpus the spore produces a germ tube, which at its end becomes a multicellular cylinder with a depressed tip. From one quadrant of the cupped end the vegetative point arises and from two others the wings proceed. The germ cylinder thus produces the thallus homoblastically. In adventive shoots the same phenomena recur. GOEBEL confirms LEITGEB'S statement as to the precocious formation of sex organs, plants only 0.1^{mm} showing their rudiments.[13] The largest sterile thallus found (and this was far beyond the usual) was 1^{mm} long.—C. R. B.

[12] GOEBEL, K., Archegoniatenstudien. XI. Weitere Untersuchungen über Keimung und Regeneration bei Riella und Sphaerocarpus. Flora **97**:192–214. *figs. 23.* 1907.

[13] Misquoted by CAMPBELL, Mosses and Ferns, 2 ed., 82, as "one millimeter."